

## Chapter 2

### Data Collection

---

This chapter contains information used to evaluate the health, environmental and regulatory concerns associated with the individual chemicals found in the lithographic blanket washes, and discusses how this information was obtained. Section 2.1 addresses the organization of the 56 specific chemicals that compose the blanket washes into generic chemical categories. Section 2.2 includes information on the physical and chemical properties of each specific chemical. Melting point, vapor pressure and the bioconcentration factor are among the many properties detailed in this section. Section 2.3 presents known human health toxicological data for each chemical. Information on the exposure routes, toxicity endpoints (such as carcinogenicity, developmental toxicity and neurologic effects), and exposure levels of concern for the chemicals are included in this section. Section 2.4 contains environmental effects data for each of the 56 chemicals. Included here is information on the chemical's acute and chronic aquatic toxicity levels for fish, invertebrates and algae, and an environmental hazard ranking for each chemical. Section 2.5 identifies which of the specific chemicals are subject to federal environmental regulations and describes each of the regulations that apply. The focus in Section 2.6 shifts from specific chemicals to the actual blanket wash formulations submitted by suppliers. In this section, safety hazard classifications for reactivity, flammability, ignitability and corrosivity have been assigned to each of the blanket washes.

#### Chapter Contents

- 2.1 Categorization/Formulations
- 2.2 Chemical Information
  - 2.2.1 Chemical Properties and Information
  - 2.2.2 Safety Hazard Factors
  - 2.2.3 Chemical Properties and Information Summaries
- 2.3 Human Health Hazard Information
- 2.4 Environmental Hazard Information
  - 2.4.1 Methodology
  - 2.4.2 Results
- 2.5 Federal Regulatory Status
- 2.6 Safety Hazard by Formulation

#### 2.1 CATEGORIZATION OF BLANKET WASH CHEMICALS FOR GENERICIZING FORMULATIONS

The chemical formulations of commercial products containing distinct chemical mixtures are frequently considered proprietary. Manufacturers of these products typically prefer not to reveal their chemical formulations because a competitor can potentially use the disclosed formulation to sell the product, often at a lower price, since the competitor did not have to invest in research and development. In addition, the performance of products may vary depending on use and shop conditions, and suppliers were concerned about the characterization of the performance of their products. The EPA was concerned about appearing to endorse brand name products that fared well in the CTSA evaluation. Due to these concerns, the Lithography Project partners developed a system to genericize the blanket wash formulations discussed in the CTSA.

In order to participate in the Project, each supplier was required to submit their product and its exact formulation to Printing Industries of America (PIA), who replaced the product brand name with a blanket wash number. The EPA completed the risk characterization using the exact formulations but without knowledge of the supplier or the brand name. The numbering system assigned by PIA is used throughout the CTSA. In addition, to maintain the confidentiality of the formulations, the CTSA reports the results using the categorization system shown below in Table

## CHAPTER 2: DATA COLLECTION

2-1. Each chemical in the blanket wash formulations was grouped into a category and the categories are used to report the results (i.e., estimated environmental release) for each formulation. The percentages of each component in a given formulation are not listed. If a printer wishes to determine the manufacturer who produces a given formulation, a list of participating manufacturers appears in the front of the document. Each participating manufacturer is aware of his or her assigned product number as well as their genericized formulation.

**Table 2-1. Categorization of Blanket Wash Chemicals**

Category	Chemicals from Blanket Wash Use Cluster in Category
Alkali/salts	Sodium Hydroxide; Tetrapotassium pyrophosphate; Ethylenediaminetetraacetic acid, tetrasodium salt
Alkanolamines	Diethanolamine
Alkoxyated alcohols	Alcohols, C <sub>12</sub> -C <sub>15</sub> , ethoxylated; Oxirane, methyl, polymer with oxirane, monodecyl ether; Polyethoxylated isodecyloxypropylamine; Poly(oxy-1,2-ethanediyl), $\alpha$ -hexyl- $\omega$ -hydroxy-; Sorbitan, monododecanoate, poly(oxy-1,2-ethanediyl) derivatives
Alkyl benzene sulfonates	Benzenesulfonic acid, dodecyl-; Benzenesulfonic acid, dodecyl-, compounds with 2-aminoethanol; Benzenesulfonic acid, dodecyl-, compounds with 2-propanamine; Benzenesulfonic acid, (tetrapropenyl)-, compounds with 2-propanamine; Benzenesulfonic acid, C <sub>10</sub> -C <sub>16</sub> -alkyl derivatives, compounds with 2- propanamine; Sodium xylene sulfonate
Dibasic esters	Dimethyl adipate; Dimethyl glutarate; Dimethyl succinate;
Ethylene glycol ethers	Diethylene glycol monobutyl ether
Ethoxylated nonylphenol	Ethoxylated nonylphenol
Fatty acid derivatives	Fatty acids, C <sub>16</sub> -C <sub>18</sub> , methyl esters; Fatty acids, C <sub>16</sub> -C <sub>18</sub> and C <sub>18</sub> -unsatd, compounds with diethanolamine; Sorbitan, mono-9-octadecanoate; Sorbitan, monolaurate; Soybean oil, methyl ester; Soybean oil, polymerized, oxidized; Tall oil, special; Fatty acids, tall oil, compounds with diethanolamine
Glycols	Propylene glycol

Category	Chemicals from Blanket Wash Use Cluster in Category
Hydrocarbons, aromatic	Benzene, 1, 2, 4-trimethyl-; Cumene; Solvent naphtha (petroleum), heavy aromatic; Solvent naphtha (petroleum), light aromatic; Xylene
Hydrocarbons, petroleum distillates	Distillates (petroleum), hydrotreated middle; Mineral spirits (light hydrotreated); Naphtha (petroleum), hydrotreated heavy; Solvent naphtha (petroleum), light aliphatic (VM&P Naphtha); Solvent naphtha (petroleum), medium aliphatic; Stoddard solvent
Esters/lactones	Butyrolactone; Propanoic acid, 3-ethoxy-, ethyl ester; Sodium bis(ethylhexyl) sulfosuccinate; Sorbitan tri-9-octadecenoate, poly(oxy-1,2-ethanediyl) derivatives
Nitrogen heterocyclics	N-methyl pyrrolidone
Propylene glycol ethers	Dipropylene glycol monobutyl ether; Dipropylene glycol methyl ether; Propylene glycol monobutyl ether;
Terpenes	Hydrocarbons, terpene processing by-products; $\alpha$ -Limonene; Linalool; Nerol; 2-Pinanol; Plinols; $\alpha$ -Terpineol; Terpinolene;

## 2.2 CHEMICAL INFORMATION

This section discusses the physical nature of the 56 specific chemicals used in blanket wash formulations. First, there is a description of the types of information that are provided for each chemical, including a glossary of chemical properties terms presented in Table 2-2. This includes their chemical and physical properties, safety hazard factors, and environmental fate. Following these descriptions, Table 2-3 lists the name, Chemical Abstracts Service (CAS) Registry Number, and common synonyms for each of the chemicals. The chemical and physical properties and safety hazard factors are then listed in the Chemical Properties and Information summary for each chemical.

### 2.2.1 Chemical Properties and Information

For each blanket wash chemical, there is a corresponding Chemical Properties and Information summary. All of the information in these summaries, except for the Safety Hazard Factors, was obtained by searching standard references, listed at the end of this chapter. This summary contains information on the following chemical and physical properties: